

AMENDMENTS TO THE CLAIMS

Please cancel Claims 1, 7, 8, 10 and 15-17; amend Claims 2-6, 9 and 11-14; and, add new Claims 18-20 as follows.

LISTING OF CLAIMS

1. (cancelled)

2. (currently amended) The ~~ejector~~ vapor compression refrigerant cycle according to claim ~~[[1]]~~ 9, wherein:

the nozzle further includes a straight section extending from the ~~[[fluid]]~~ outlet port to an upstream side by a predetermined distance;

the straight section has an inner radial dimension that is substantially constant;

the straight section is arranged at a direct downstream side of the nozzle tapered section;

the needle is disposed in the nozzle to define a fluid passage therebetween, and the fluid passage has a throttle section at which a cross-sectional area of the fluid passage becomes smallest; and

the straight section and the nozzle tapered section are connected to each other at the throttle section.

3. (currently amended) The ~~ejector~~ vapor compression refrigerant cycle according to claim ~~[[1]]~~ 9 wherein:

the needle tapered section includes a root section, and an end section located downstream of the root section; and

the end section has $[\alpha]$ an end section taper angle $[(\phi_1)]$ that is different from a root section taper angle $[(\phi_2)]$ of the root section.

4. (currently amended) The ~~ejector~~ vapor compression refrigerant cycle according to claim $[[1]]$ 9 wherein:

the needle tapered section includes a root section, and an end section located downstream of the root section; and

the end section has $[\alpha]$ an end section taper angle $[(\phi_1)]$ that is smaller than $[[the]]$ a root section taper angle $[(\phi_2)]$ of the root section.

5. (currently amended) The ~~ejector~~ vapor compression refrigerant cycle according to claim $[[1]]$ 9, wherein the needle tapered section has a downstream end surface that is formed in one of a substantially hemispherical shape and a flat shape.

6. (currently amended) The ~~ejector~~ vapor compression refrigerant cycle according to claim $[[1]]$ 9, further comprising an actuator for displacing the needle in an axial direction of the needle.

7.-8. (cancelled)

9. (currently amended) A vapor compression refrigerant cycle comprising:
a compressor for compressing refrigerant;
a radiator for cooling high-pressure refrigerant discharged from the compressor;

an evaporator for evaporating the refrigerant;

an ejector having a nozzle for decompressing the high-pressure refrigerant from the radiator[[:]], and a housing which surrounds the nozzle to define a flow passage through which a low-pressure refrigerant from the evaporator is drawn and extends downstream of the nozzle to define a mixing portion in which a nozzle jet flow of the high-pressure refrigerant from an outlet port of the nozzle and the low-pressure refrigerant drawn are mixed, wherein:

~~an evaporator for evaporating a low-pressure refrigerant after being decompressed; and~~

~~a gas-liquid separator for separating refrigerant discharged from the ejector into gas refrigerant and liquid refrigerant, the gas-liquid separator including a gas-refrigerant outlet coupled to a refrigerant suction side of the compressor and a liquid refrigerant outlet coupled to an inlet side of the evaporator, wherein:~~

the ejector nozzle includes

~~a nozzle including a nozzle tapered section that has an inner passage with a radial dimension reduced toward a nozzle outlet port from which high-speed refrigerant is jetted,~~

the outlet port from which the nozzle jet flow is jetted, and a nozzle tapered section located at an upstream side of the outlet port, wherein the nozzle tapered section has an inner passage with a radial dimension reduced toward the outlet port; and wherein the ejector further comprises:

a needle having a needle tapered section disposed in the inner passage, the needle tapered section having a cross sectional area reduced toward a downstream end of the needle~~[[, and]]~~; wherein

~~a pressure increasing portion in which gas refrigerant from the evaporator is drawn by entrainment of the high speed refrigerant jetted from the nozzle outlet port, wherein:~~

the needle is supported such that the downstream end of the needle is always positioned downstream with respect to the ~~nozzle~~ outlet port of the nozzle between a small flow amount and a large flow amount jetted from the ~~[[fluid]]~~ outlet port; and

the nozzle tapered section has a taper angle ($\Phi 1$) which is equal to or larger than a taper angle ($\Phi 2$) of the needle tapered section; and wherein

the flow passage defined inside the housing has an inlet angle (Φ) set equal to or less than 40 degrees, and

the outlet port, the nozzle tapered section, the needle tapered section and the inlet angle are set to make the nozzle jet flow expanded and boiled so that flow speed of the nozzle jet flow is increased up to the supersonic speed, and a boundary face, which is an outer periphery of the nozzle jet flow, diffused to a position where the

nozzle jet flow and the low-pressure refrigerant flowing around the nozzle jet flow balance with each other.

10. (cancelled)

11. (currently amended) The ~~ejector~~ vapor compression refrigerant cycle according to claim [[1]] 9, wherein the needle is supported to be fixed in relation to the nozzle.

12. (currently amended) The ~~ejector~~ vapor compression refrigerant cycle according to claim [[1]] 9, wherein the needle is supported to be movable with respect to the nozzle.

13. (currently amended) The ~~ejector~~ vapor compression refrigerant cycle according to claim [[1]] 9, wherein the downstream end of the needle always extends past a downstream end of the nozzle.

14. (currently amended) The ~~ejector~~ vapor compression refrigerant cycle according to claim [[1]] 9, wherein the needle always extends completely through the nozzle.

15.-17. (cancelled)

18. (new) The vapor compression refrigerant cycle according to claim 9, further comprising, a gas-liquid separator for separating refrigerant discharged from the ejector into gas refrigerant and liquid refrigerant, the gas-liquid separator including a gas-refrigerant outlet coupled to a refrigerant suction side of the compressor and a liquid refrigerant outlet coupled to an inlet side of the evaporator.

19. (new) The vapor compression refrigerant cycle according to claim 9, wherein the mixing portion is defined by a generally cylindrical portion of the housing.

20. (new) The vapor compression refrigerant cycle according to claim 9, wherein a length of the mixing section in a direction of refrigerant flow is greater than a length of the needle tapered section of the needle in the direction of refrigerant flow.